EXERCISE 18 TRADITIONAL TECHNIQUES IN MASS REARING OF QUEEN BEES

Structure

18.0 INTRODUCTION

Due to fast growing interest of farmers in beekeeping, the demand for honeybee colonies is rapidly increasing. To cope up the demand of honeybee colonies, queen bees are also required in equal number. Queen bees are also required for meeting the demand of colonies which have lost their queen bees owing to their accidental death. It is commonly recommended to change one year old queen bee in the hive which further accentuates the demand for rearing newer queen bees. Thus, mass rearing of queen bees is required. It is undertaken from the best selected 'breeder' colonies. Commonly, beekeepers resort to 'division method' for rearing of queen bees but this is not a method of 'mass' rearing of queen bees. For mass queen bee rearing, there are some traditional methods which seldom require much skill and are quite easier in comparison to the latest techniques of mass queen bee rearing. The traditional methods also do not require much drudgery and the available material can serve the purpose.

Objectives

The aim of this exercise is to:

- make you familiar with the traditional techniques of mass rearing of queen bees, and
- impart skill for the replacement of older queen bees, for sale, etc.

18.1 PROCEDURE

Before explaining the procedure, let us look into the principle of this exercise.

Principle

Traditional methods include 'Miller' method, 'Alley' method, 'Smith' method and 'Hopkin' method. These methods involve getting young worker bee larvae from selected 'breeder' colonies and rearing these into queen bees in some other 'cell builder' colonies.

Requirements

1. Apiary with numerous hive honeybee colonies,
2. Breeder colony,
3. Cell builder colony,
4. Vertical queen excluder,
5. Empty dark worker brood comb,
6. Knife/ blade,
7. Frames without wire,
8. Comb foundation,
9. Queen rearing frame with queen cell raising bars,
10. Sugar solution in water (1:1),
11. Match sticks, and
12. Molten bees wax.

Steps

i) Preparing Breeder Colony

1. Prepare at least one **'Breeder' colony** to get very young larvae from this colony for getting them transformed into the high quality queen bees *en masse*.
2. To prepare the breeder colony, divided the hive body of the breeder colony into two compartments by inserting a vertical queen excluder so that one part contains six/ seven combs of honey and pollen and other part contains one comb of open brood and one comb of sealed brood.
3. In between these two brood combs, one empty and slightly dark coloured comb with worker brood cells, or such frame as per the requirements of the technique being followed, is put into for the queen to lay eggs. Confine the mother queen bee into this three combs compartment of the breeder colony.
4. The breeder colony is required to be supplemented with sugar syrup feeding for enhancing egg laying and brood rearing by the nurse bees.
5. After three days of deposition of eggs, the empty dark comb is now full of newly hatched larvae, ready to be transferred into cell builder colony/ for grafting into the queen cell cups. Every time while removing the larvae, replace the larval comb with another empty comb for egg laying.
6. After emergence of adult bees from the earlier sealed brood comb, replace it with another sealed brood comb to ensure the sufficient population of nurse bees in the colony.

ii) Preparing Cell Builder Colony

1. Prepare '**Cell Builder**' colony which has to be established four days prior to larval grafting by dequeening at least a ten bee-frame strength colony.

2. The dequeened colony will raise a few queen cells from which extract the royal jelly to prime the artificial queen cell cups after discarding the queen/ royal larvae.

3. Give extra young bees or sealed worker brood combs to this colony to maintain sufficient number of nurse bees.

4. The comb arrangement in the cell builder colony should be kept as per given:

   H S E Y C P E S H

   where, H = honey comb,

   S = sealed worker brood comb,

   E = near emergence brood comb,

   Y = young/ larval (4-5 days old) brood comb,

   C = frame with queen cell cups/ grafted larvae or comb with larvae from the breeder colony, and

   P = pollen comb.

5. Decide about the method to be followed for mass rearing of the queen bee.

i) **Miller Method :** The steps of this method are methods as follows :

   1. Cut a comb foundation into deep V-shaped sections reaching about two third way down the frame.

   2. Remove wires from the frame except the top one before fixing the cut comb foundation.

   3. Insert the frame into the middle of brood nest of the selected strong queen-right breeder colony.

   4. By feeding the colony with sugar syrup, the colony is induced to raise comb cells on V-shaped comb foundation.

   5. Allow time to queen to lay eggs in the raised brood cells especially at and near the margins/ edges.

   6. Remove the comb from the mother/ breeder colony and insert into already arranged cell builder colony between larval brood and pollen comb after the larvae have hatched out and are still less than 24 hours of age.

   7. The bees will build queen cells along the border of the given V-cut comb and after about 10 days sealed queen cells would be ready for transplanting.

   8. Up to 30 queen cells are quickly produced on each comb under favourable conditions.

ii) **Alley Method :** Follow the under mentioned steps for this method :

   1. The breeder queen is induced to lay eggs in the newly drawn/ a little dark comb.

2. After 3 days of egg laying, take the comb with hatched out larvae into a room maintaining temperature of 34-35°C.
3. Cut the comb into strips of one cell wide rows.
4. Shave the cell walls of the comb containing the larvae down to about 6 mm from the cell base.
5. Destroy two out of every three adjacent larvae (by rotating a match stick in the cells).
6. Glue the prepared one cell wide strip containing young larvae to lower edge of a comb trimmed into a semi-circle.
7. Transfer this comb into the cell builder colony.
8. Workers bees would remodel the cells containing newly hatched larvae and rear them into gyne cells.

iii) **Smith Method :** Follow the under mentioned steps to learn the Smith method of mass queen bee rearing :

1. The breeder queen is induced to lay eggs in the newly drawn/ a little dark comb.
2. After 3 days of laying, take the comb with hatched out larvae into room at 34-35°C temperature.
3. Cut the comb into strips of one cell wide rows.
4. Shave the cell walls of the comb containing the larvae down to about 6 mm from the cell base.
5. Destroy two out of every three adjacent larvae (by rotating a match stick in the cells).
6. Glue/ fix every such prepared one cell wide strip containing young larvae to lower edge of queen cell bar of queen rearing frame.
7. Transfer this frame into the cell builder colony.
8. Workers bees would remodel the cells containing newly hatched larvae and rear them into gyne cells.

iv) **Hopkin Method :** Follow the under mentioned steps for this method :

1. The breeder queen is induced to lay eggs in the newly drawn/ a little dark comb.
2. After 3 days of laying, take the comb with hatched out larvae into room at 34-35°C temperature.
3. Destroy by crushing with sharp object three brood cell rows in every four keeping 4th with young larvae intact.
4. Destroy two out of every three adjacent larvae (by rotating a match stick in the cells) in each brood cell row kept intact as above.
5. Such prepared comb is laid on the top bars of the combs in the brood chamber of cell builder colony with the prepared side facing downward.

6. To provide space for bees to raise the queen cell properly, place one empty wooden frame without wires beneath the laid over comb.

7. The bees will start raising the queen cells by extending the left over cells with live larvae from the lower side of the comb.

18.2 OBSERVATIONS AND RESULT

By doing all the steps of each method, you will learn the best technique of mass queen bee rearing.

18.3 PRECAUTIONS

You have to observe the following precautions for the

- Ensure that at the time of shifting of larvae to the cell builder colony, these have not to be more than 24 hours of age.
- The frame or comb containing young worker larvae should be handled very gently and should not experience any jerk.
- Breeder and cell builder colonies should be avoided to be given smoke as far as possible.
- Any manipulations to the combs containing young larvaè should be carried out in as little time as possible and should be done at temperature 34-35°C.